Tablet PC

Connector Systems

molex®

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INTRODUCTION

Molex offers one of the most complete ranges of micro-miniature fine-pitch connectors to support designers and manufacturers of Tablet PCs, e-Readers and other mobile devices. Our lineup includes innovations such as 0.25mm pitch FPC connectors, 2.60mm width board-to-board versions, and Micro IDT Coaxial types, along with a wide variety of industry standard connectors for memory card, I/O, micro-SIM, battery, camera module, switch and antenna applications.

With a global network of design, manufacturing and customer service centers, Molex is ready to help move your tablet/mobile device idea quickly from design to delivery. This catalog showcases Molex products to meet the growing technology trends for smaller form factors, increased signal density, shielding and more advanced functionality, and easy production assembly of the latest tablet and other mobile devices.

For Form Factor
- Tablet PC
- e-Reader
- Mobile Phones

For Applications
- Internal Antenna
- Battery
- Camera Module
- Earpiece
- Hinge
- I/O
- LCD
- Memory Card
- Microphone
- SIM
- Speaker
- Switch

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Tablet PC Connector Systems

INNOVATIONS FOR TABLET/MOBILE DEVICE APPLICATIONS

Slim and Narrow

0.70mm Mated Height

2.60mm Mated Width
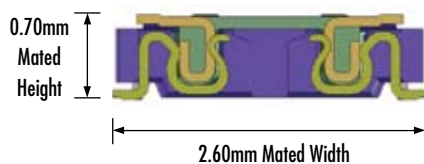
Our board-to-board and FFC/FPC connectors offer ultra low profiles, and a broad range of circuit sizes and mounting options to suit your application.

Small and Fast

Mid-mount for greater space saving advantage
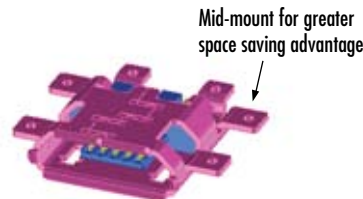
Molex's I/O systems offer high durability for fast data transfer with low profiles, compact footprints and options for integrating multiple functions.

Flexible and Clear

Our Micro IDT Coaxial system provides superior signal quality and better capabilities to wind through tight spaces compared to FPC.

TABLET PC/MOBILE DEVICE APPLICATIONS

Tablet PC

e-Reader

Mobile Phone

3

INTRODUCTION

Micro Board-to-Board (BTB) connectors are commonly used in tablet devices to connect sub-modules and sub-assemblies. Molex's 0.40mm and 0.50mm pitch BTB versions include various terminal locks that help guarantee connections stay secure even in shock and vibration situations.

Molex's SlimStack series offers across-the-board space-saving features. These include mated heights as low as 0.70mm, widths as narrow as 2.60mm, and a line of J-Lead solder tail versions that offer significant space savings versus standard gull-wing types.

Product Summary

■ Pitch: 0.40 and 0.50mm
■ Mated heights from 0.70mm
■ Narrow width designs
■ Circuit sizes: 6 to 100
■ Space saving solder tail designs
■ Long wipe length
■ Reliable contact and locking features to withstand shock and vibration

molex®

Board-to-Board Connectors

FEATURES AND BENEFITS

| Space Savings | Various Locking Features ➡ Superior Mechanical Forces | Electrical Reliability |

Space Savings

0.40mm (.016") Pitch Standard Gull Wing

5.20mm (.205")
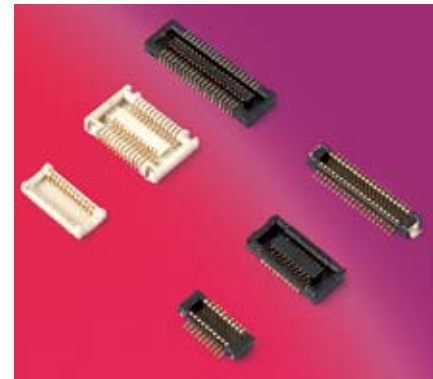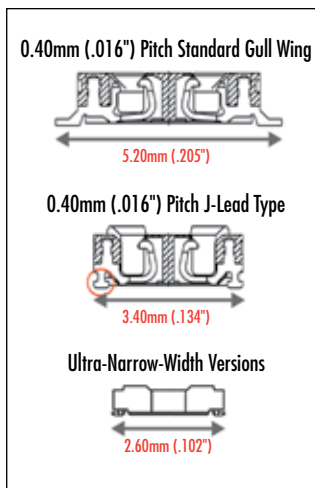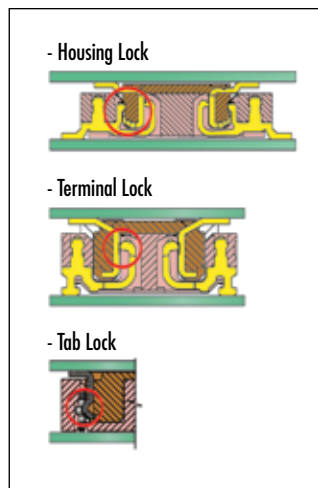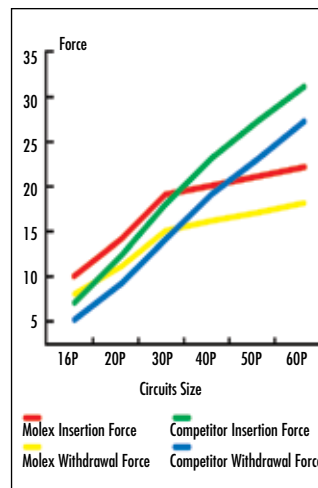
0.40mm (.016") Pitch J-Lead Type

3.40mm (.134")

Ultra-Narrow-Width Versions

2.60mm (.102")

Various Locking Features

- Housing Lock
- Terminal Lock
- Tab Lock

Superior Mechanical Forces

Force / Circuits Size (16P 20P 30P 40P 50P 60P)

Molex Insertion Force — Competitor Insertion Force
Molex Withdrawal Force — Competitor Withdrawal Force

Electrical Reliability

= Wipe Length
Up to 0.65mm (.026") wipe length

Narrow width and J-Lead types provide maximum space savings

Friction locks provide added mating retention to withstand shock or vibration.

Friction lock on select circuits provides superior mating/unmating forces.
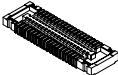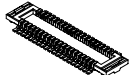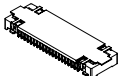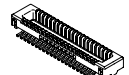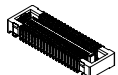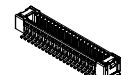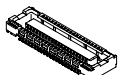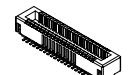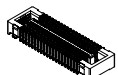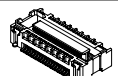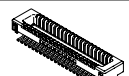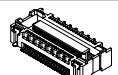
Long wipe length helps provide good electrical reliability.

SELECTION MATRIX
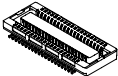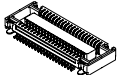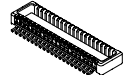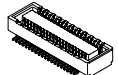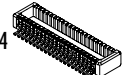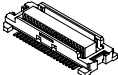
0.40mm Pitch SMT Board-to-Board Connectors

Mated Height (mm)	Mated Width (mm)	Receptacle	Plug	Circuit Sizes	Current	Voltage	Key Feature
0.70	2.60	503548	503552	6, 12, 14, 16, 18	0.3A	50V	Hi-Retention Narrow Width
0.70		503304	503308	12, 16, 18, 20, 26, 30, 40, 42, 44, 50, 60	0.3A	50V	Two-point contact Narrow Width
1.00		503489	503308	30, 44	0.3A	50V	Two-point contact Narrow Width
1.00		502426	502430	14, 20, 22, 26, 30, 32, 34, 40, 44, 50, 60, 64, 70, 80, 90	0.3A	50V	Narrow Width
1.50		502426	503460	80	0.3A	50V	Stronger Solder Tabs (503460) Narrow Width
1.50		503105	503108	40, 44, 50	0.3A	50V	No Tabs for Shorter Length Narrow Width

molex® **Board-to-Board Connectors**

0.40mm Pitch SMT Board-to-Board Connectors

Mated Height (mm)	Mated Width (mm)	Receptacle		Plug		Circuit Sizes	Current	Voltage	Key Feature
0.90		501591		501594		10, 12, 20, 22, 24, 26, 30, 34, 40, 44, 50, 54, 70	0.3A	50V	J-Lead
1.30		501527		501531		20, 30, 32, 34, 40, 50, 80, 90	0.3A	50V	J-Lead
1.50		51338		55909		10, 12, 20, 22, 24, 26, 30, 34, 40, 44, 50, 54, 60, 64, 70, 80, 90, 100	0.3A	50V	J-Lead
1.70	3.40	501635		501639		30, 40, 50	0.3A	50V	J-Lead
2.00		51338		501745		34, 50, 60, 80	0.3A	50V	J-Lead
2.50		501635		502396		100	0.3A	50V	J-Lead
1.80		500913		55909		24, 30, 40, 50, 60, 70, 90, 100	0.3A	50V	Rec. also mates with 501745
2.30	4.20	500913		501745		40, 50, 60	0.3A	50V	Rec. also mates with 55909
3.20	4.35	54552		503376		30, 34, 40	0.3A	30V	Right Angle with Pegs

0.50mm Pitch SMT Board-to-Board Connectors

Mated Height (mm)	Mated Width (mm)	Receptacle		Plug		Circuit Sizes	Current	Voltage	Key Feature
1.50		54722		55560		20, 22, 24, 30, 34, 40, 50, 60, 80	0.5A	50V	Without Solder Tabs
2.00	6.00	54363		55650		20, 30, 40, 50, 60, 70	0.5A	50V	With Friction Lock
2.50	5.30	54102		53885/500334		16, 20, 30, 40, 50, 60, 70	0.5A	50V	Without Solder Tabs
3.00	5.40	52991/54167		53748		20, 30, 40, 60, 70, 80	0.5A	50V	Two Mating Receptacles

INTRODUCTION

Molex offers a wide variety of ultra low-profile FPC connectors to meet various tablet device needs. Our range includes some of the world's smallest versions, with heights as low as 0.62mm and pitch sizes as small as 0.25mm.

We offer both front and BackFlip™ actuator styles, along with top, bottom and dual contact versions. Circuit sizes range from 4 to 61. Plating is available in gold to ensure good electrical contact and to complement gold-plated contacts on FPC cable.

Product Summary
- Pitch: 0.25, 0.30 and 0.50mm
- Circuit sizes: 4 to 61
- Ultra low profiles from 0.62mm
- Front and BackFlip™ type actuators
- Top, bottom and dual contact designs
- Gold plating
- Packaging: Embossed Tape

molex®
FPC Connectors

FEATURES AND BENEFITS
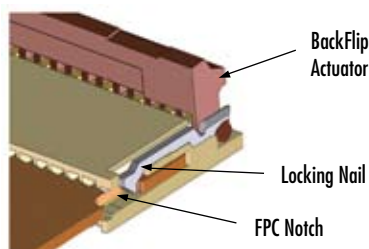
502250 Series has locking nail for secure cable insertion
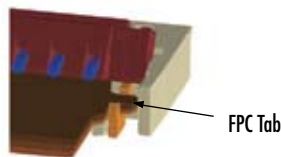
501628 Series has notch for FPC tab for complete cable insertion
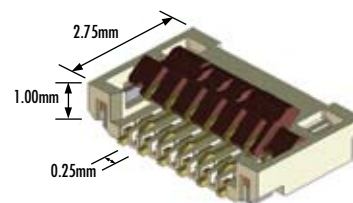
0.25mm pitch 502078 Series offers the industry's smallest overall size
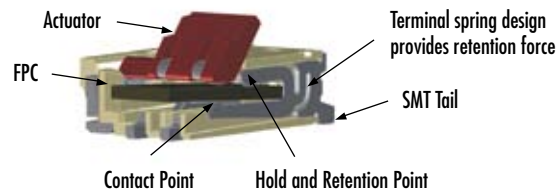
Terminal design of 500797 holds FPC in place and provides secure retention

SELECTION MATRIX
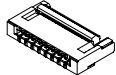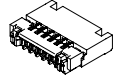
0.25mm Pitch SMT ZIF FPC Connectors

	Height (mm)	Width (mm)	Series Number	Circuit Sizes	Mounting	Actuator Type	Contact Type	Contact Plating	Current	Voltage	FPC Thickness
	1.00	2.75	502078-**10 with Short Actuator	17, 21, 25, 33, 39, 51	Right Angle	Front Flip	Bottom	Gold	0.2A	50V	0.20mm
		2.98	502078-**60 with Long Actuator	37, 39, 61							
	1.65	2.98	503320	25, 37, 41	Right Angle	Front Flip	Bottom	Gold	0.3A	50V	0.20mm
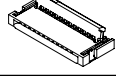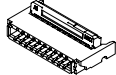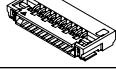
0.30mm Pitch SMT ZIF FPC Connectors

	Height (mm)	Width (mm)	Series Number	Circuit Sizes	Mounting	Actuator Type	Contact Type	Contact Plating	Current	Voltage	FPC Thickness
	0.62	4.37	502761	33, 49	Right Angle	Front Flip	Bottom	Gold	0.2A	50V	0.12mm
	0.90	3.10	501628	11, 21, 27, 31, 33, 35, 37 39, 45, 51	Right Angle	Front Flip	Bottom	Gold	0.2A	50V	0.20mm
	0.90	4.19	502250	17, 21, 23, 27, 33, 35, 39, 41, 51	Right Angle	BackFlip	Dual	Gold	0.2A	50V	0.20mm

FPC Connectors

0.30mm Pitch SMT ZIF FPC Connectors

	Height (mm)	Width (mm)	Series Number	Circuit Sizes	Mounting	Actuator Type	Contact Type	Contact Plating	Current	Voltage	FPC Thickness
	1.05	3.85	500797	11, 15, 17, 23, 25, 27, 31, 33, 35	Right Angle	Front Flip	Bottom	Gold	0.2A	50V	0.20mm
	1.15	3.80	502598	23, 25, 27, 29, 33, 39, 45, 51	Right Angle	BackFlip	Dual	Gold	0.2A	50V	0.20mm
	1.10	3.75	501616-**75 with Short Actuator	19, 25, 27, 29	Right Angle	BackFlip	Top	Gold	0.2A	50V	0.20mm
		4.25	501616-**85 with Long Actuator	35, 39, 41, 45, 51							
	1.20	4.00	503425	61, 75	Right Angle	BackFlip	Dual	Gold	0.2A	50V	0.20mm

0.50mm Pitch SMT ZIF FPC Connectors

	Height (mm)	Width (mm)	Series Number	Circuit Sizes	Mounting	Actuator Type	Contact Type	Contact Plating	Current	Voltage	FPC Thickness
	0.80	3.20	501461	4, 5, 6, 8	Right Angle	BackFlip	Bottom	Gold	0.3A	50V	0.12mm
	0.90	4.25	502118	45, 50	Right Angle	BackFlip	Dual	Gold	0.5A	50V	0.20mm
	1.00	4.00	503480	4, 6, 8, 10, 12, 14, 16, 17, 18, 20, 22, 32	Right Angle	BackFlip	Dual	Gold	0.5A	50V	0.30mm
	1.10	3.10	51441	8, 10, 11, 12, 20, 22, 24	Right Angle	Front Flip	Bottom	Gold	0.5A	50V	0.30mm

HOW TO USE THE BACKFLIP CONNECTOR

External View: Locking Feature

Flip open actuator

Insert cable

Close actuator

Push down gently to lock
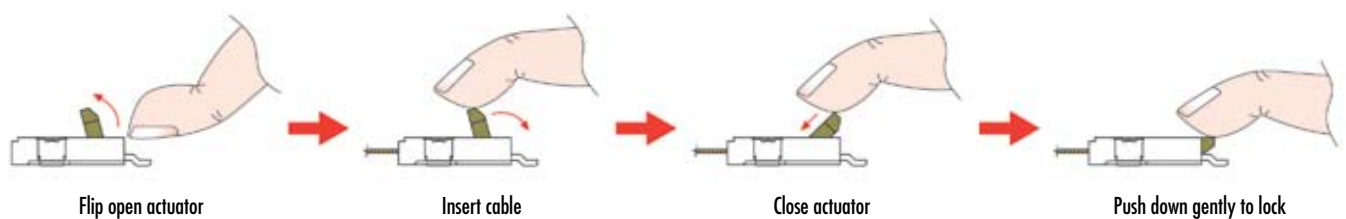
INTRODUCTION

The microSD standard covers the world's smallest memory card connectors. As the needs for this standard evolve, Molex is at the forefront of providing innovative connector solutions.

Molex offers three styles of microSD connectors: Push-Push, Hinge and Push-Pull versions. The Push-Push versions include card extraction features to help provide smooth card insertion and removal.

Product Summary
- ■ Push-Push, Hinge and Push-Pull types
- ■ Normal and reverse mount versions
- ■ Detect switch to recognize card insertion
- ■ Profiles as low as 1.28mm
- ■ Card pop-out prevention features
- ■ Gold over nickel plating
- ■ Embossed tape packaging

microSD Card Connectors
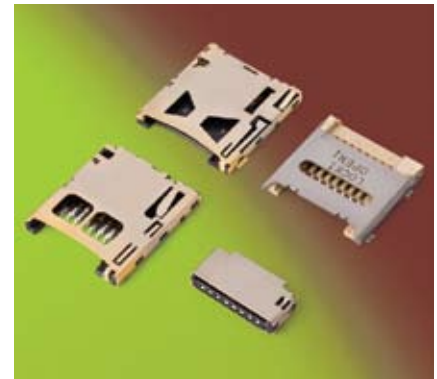
FEATURES AND BENEFITS

Push-Push Type

1.28mm height 503398 series

Anti-fly-out brake features

Hinge Type

Metal hinge stays in upright position and various angles to facilitate card insertion

Beveled spring terminal design provides secure contact force and mating

Push-Pull Type

Space saving design leaves room for component placement underneath
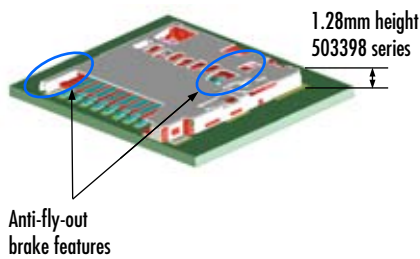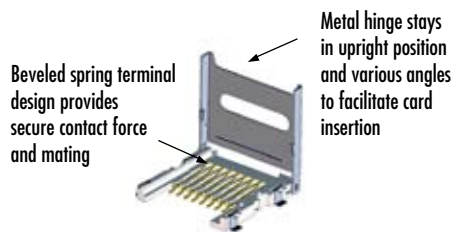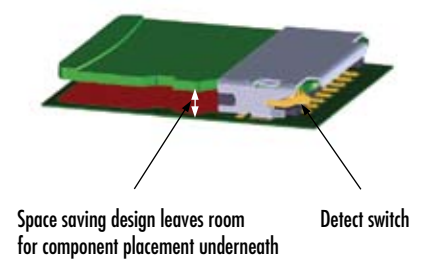
Detect switch

SELECTION MATRIX

Push-Push Type

	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	503398-0891	1.28	13.10	14.05	16.85	Yes	Normal
	503182-0852	1.45	14.94	14.95	17.35	Yes	Normal
	104042-0811	1.78	14.00	15.10	17.30	Yes	Reverse
	502570-0893	1.80	13.80	15.50	17.20	Yes	Normal
	502774-0891	1.80	14.30	16.00	18.10	Yes	Reverse
	500873-0816	1.88	14.00	15.20	16.80	No	Normal

Push-Pull Type (Full Size)

	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	104031-0811	1.42	11.95	11.40	15.40	Yes	Normal

molex® microSD Card Connectors

Push-Pull Type (Half Size, Low Profile)

	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	105027-0001*	1.70	11.30	7.00			
	105027-1001*	1.70	11.30	7.00	15.15	Yes	Normal
	105078-0001	2.00	11.30	7.40			

* Note: 105027-0001 has SD mode switch; 105027-1001 has SPI mode switch.

Push-Pull Type (Half Size)

	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	47309-2651	2.65					
	47309-2851	2.85					
	47309-3351	3.35	11.40	5.50	15.30	Yes	Normal
	47309-3551	3.55					
	47309-3751	3.75					
	47309-5251	5.25		5.70			

Hinge Type

	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	500901-0801	1.93	14.60	14.50	15.00	No	Normal

Combo Type

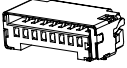|	Order Number	Height (mm)	Width (mm)	Depth (mm)	Depth with Card (mm)	Detect Switch	PCB Mounting
	49619-1611 8-Pin SIM: Push-Pull microSD: Push-Push	2.75	16.65	18.60	25.35 (SIM) 23.05 (microSD)	No (SIM) Yes (micsoSD)	Normal
	49448-1611 8-Pin SIM: Push-Pull microSD: Push-Push	2.75	17.70	17.70	25.48 (SIM) 23.05 (microSD)	No (SIM) Yes (micsoSD)	Normal

MICROSD CARD SIZE VERSUS OTHER MEMORY CARDS STANDARDS

	microSD	RS-MMC	MultiMedia Card	miniSD	SD Card	SD I/O Card	Memory Stick Duo	Memory Stick	xD-Picture Card	Smart Media	Compact Flash
Card Details											
Size (mm)	11x15x1.0	24x18x1.4	24x32x1.4	20x21.5x1.4	24x32x2.1	24x40x2.1	20x31x1.6	21.5x50x2.8	20x25x1.7	37x45x0.76	42.8x36.4x3.3
Weight (g)	0.4	0.8	1.5	1.0	2	4	2	4	2	2	8 - 15
Vol. (mm³)	165	605	1,075	602	1,612	2,016	992	3,010	850	1,265	5,141
No. of Pins	8	7	7	11	9	9	10	10	18	22	50

* Note: For latest capacity information, see each industry website or ask your memory card supplier.

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INTRODUCTION

Molex's 0.40mm pitch Micro IDT Coaxial connector system and 1.20mm pitch Pico-EZmate crimp connector system are designed for tight-packaging applications such as mobile phones and Tablet PCs. Both systems offer unique features to route wiring through compact and hard-to-reach areas.

The micro coaxial version uses IDT technology to mass terminate the coaxial cable. Extremely thin wires are bundled together in order to maneuver through twists and turns that are too severe for FPC to handle.

The Pico-EZmate system features a unique horizontal-style mating system that enables the cable-side to be mated from the top. This provides easier assembly, especially in space-constrained applications.

Product Summary
- 0.40mm pitch IDT type and 1.20mm pitch crimp type
- Straight and right angle PCB receptacles
- Custom cable assemblies for IDT type
- Friction locks for secure mating retention
- Solder tabs for secure PCB retention
- Wire retainers on IDT type for additional signal integrity support
- Polarization features to ensure proper mating

molex®

0.40mm Pitch Micro IDT Coaxial and 1.20mm Pitch Pico-EZmate™ Wire-to-Board Connector Systems

FEATURES AND BENEFITS

0.40mm (.016") Pitch Micro IDT Coaxial

Multiple grounding tabs
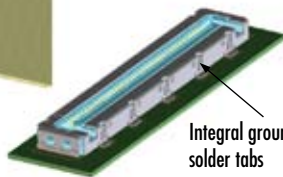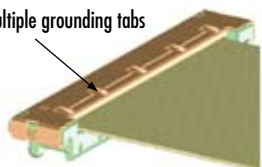
Integral grounding/ solder tabs

Smooth Handling Around Turns
Molex's Micro IDT Coaxial wire-to-board system can route signaling through tight twists and turns better than FPC

1.20mm (.047") Pitch Pico-EZmate™

Unique top-entry mating style provides space savings

Mated Height
2-5 ckts (1.55mm)
6 ckts (1.65mm)

SELECTION MATRIX

0.40mm Pitch Micro Coaxial Wire-to-Board Connectors

Mated Height (mm)	Mated Width (mm)	Description		Series Number	Circuit Sizes	Wire Gauge	Current	Voltage
0.90	5.40		PCB Receptacle, SMT, Side Entry	502691	30, 40, 50	N/A	0.15A	30V
1.15	5.50			501044			0.2A	
2.40	3.94		PCB Receptacle, SMT, Top Entry	501083				
0.90	5.40	Side	Cable Assemblies Custom Configurations Include: Side Entry-to-Side Entry Top Entry-to-Side Entry Top Entry-to-Top Entry	Contact Sales for Ordering Details	30, 40, 50	44 AWG	0.15A	30V
1.15	5.50							
2.40	3.94	Top				42 AWG	0.2A	

1.20mm (.047") Pitch Pico-EZmate™ Wire-to-Board Connectors

	Series Number	Mated Height (mm)	Mated Width (mm)	Description	Wire Gauge	Current	Voltage	Circuit Sizes
	78172-0411	NA	NA	Crimp Terminal	28-30 AWG	1.5A	50V	2-6
	78172	1.55 (2-5 ckts) 1.65 (6 ckts)	4.53	Crimp Housing	N/A			
	78171			PCB Header				

INTRODUCTION

Molex offers SIM card connectors in various configurations from low profile block types with connector height as low as 0.95mm to those with guide rail, hinge and push-push mechanism.

New micro-SIM
Molex is now introducing ultra-compact micro-SIM connectors to meet the growing requirements for this form factor in Tablet PCs and other mobile devices. Molex is working closely with industry leaders to develop the features needed such as push-push, guiding function and card insertion/extraction requirements.

Product Summary
- micro-SIM and SIM styles
- Block, Guided, Hinged and Push-Push types
- 6-pin and 8-pin versions available
- Gold plating

SIM and micro-SIM Card Connectors

NEW MICRO-SIM CAPABILITIES

Standard SIM Connector
47553 Series

19.35mm
26.5mm
1.80mm height

micro-SIM Connector
(Push-Push type)

15mm
16mm
1.80mm height
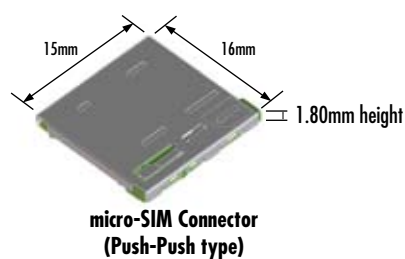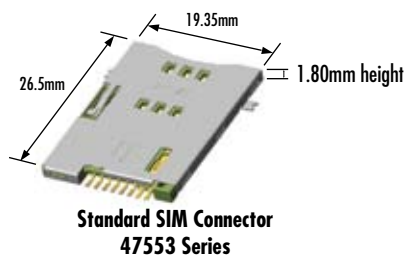
50% Space Savings
Molex's new micro-SIM connectors save about 50% of space compared to standard SIM connectors. Molex has the capabilities to produce standard and custom micro-SIM connectors in push-push, hinge and guided styles. Contact Molex for further details.

STANDARD SIM FEATURES AND BENEFITS

Hinge Type

Dimples add extra strong locking force

Push-Push Type

Detect switch recognizes card insertion

Block Type

Spoon-shaped design allows card insertion from X, Y, Z directions

Guided Type

Guide rail and stopper to hold SIM in position and ensure good contact
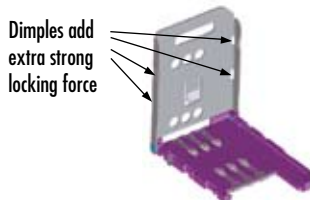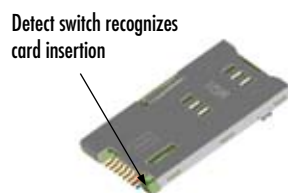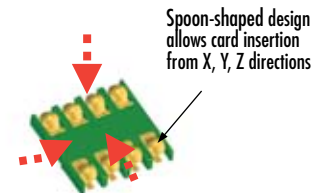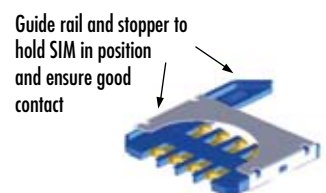
SELECTION MATRIX

6-Pin SIM Card Connectors

Push-Push Type
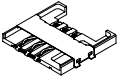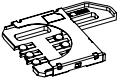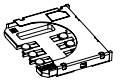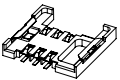
	Order Number	Height (mm)	Width (mm)	Length (mm)
	47553-0001 With Detect Switch	1.80	19.35	26.50
	105034-1001	2.60	19.40	26.20

Guide Rail Type
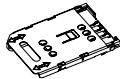
	Order Number	Height (mm)	Width (mm)	Length (mm)
	105048-1001	1.45	16.10	19.10
	47548-0001	1.90	16.20	17.10

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6-Pin SIM Card Connectors
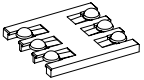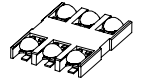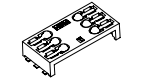
Guide Rail Type

	Order Number	Height (mm)	Width (mm)	Length (mm)
	47308-0001	2.00	15.30	17.10
	47468-0001	2.00	16.25	21.70
	47637-0001	2.00	16.25	13.50
	47273-0001	2.70	15.65	16.45
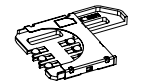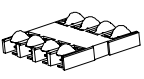
Hinge Type

	Order Number	Height (mm)	Width (mm)	Length (mm)
	47388-2001	1.90	17.70	25.52
	105039-0001	2.30	15.80	26.85

Block Type

	Order Number	Height (mm)	Width (mm)	Length (mm)
	47535-0001	0.95	8.00	10.00
	47312-1001	1.30	7.62	10.00
	47019-1502	1.50	7.62	10.00
	47019-1602	1.60		
	47019-1802	1.80		
	47019-2002	2.00		
	47019-2402	2.40		
	47037-0001 With Stand Off Height 3.00mm	3.60	8.30	17.70

8-Pin SIM Card Connectors

	Order Number	Height (mm)	Width (mm)	Length (mm)
	78526-0001 Push-Push with Detect Switch	1.50	18.70	27.00
	47603-0001 Push-Push with Detect Switch	1.90	19.35	26.30
	47468-8001 With Guide Rail and Stopper	2.00	16.25	21.70
	47494-0001 Block Type	1.50	10.00	10.16

INTRODUCTION

Molex supplies a wide range of battery connectors in SMT mounting type, all designed to provide robust and reliable contact interface. We also provide double compression type battery connectors that do not require SMT soldering.

Our battery connectors are designed to meet the rigorous requirements of mobile applications. To meet the need for slim and compact phone design, we've developed pogo pin connectors that can provide over 100g spring force and withstand 10,000 mating cycles.

Product Summary
■ Compression-style contacts
■ SMT and double compression type
■ Top and Side entry type
■ Durability: 10,000 typical*
■ Spring force: 100 - 150N typical*
■ Current rating: 1 - 2A typical*
■ Circuit sizes: 2 to 8
■ Pitch: 1.20, 2.00, 2.50 and 3.00mm

* Please check specifications for those product specific information

FEATURES AND BENEFITS

Top Entry Type Battery Connector

Battery pack is inserted from the top
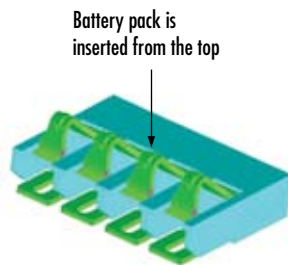
Low Profile Side Entry Type Battery Connector

Battery pack is inserted from the side

Connector sits on the edge of PCB
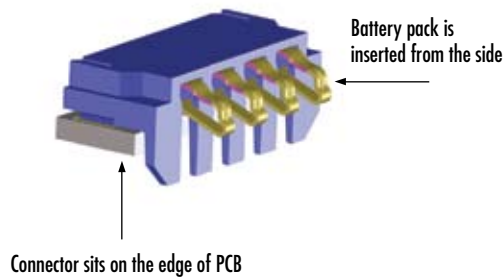
Pogo Pin is Used for Ultra Slim Design

Soder tabs increase the PCB retention force
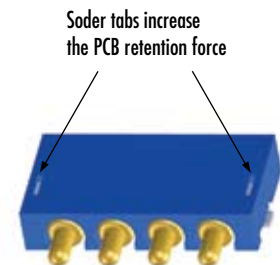
SELECTION MATRIX

2-Circuit Battery Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	47182-1001	2.00	2.95	4.10	5.98	Vertical

3-Circuit Battery Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	105040-0001	2.00	4.90	6.00	6.46	Vertical
	47275-0001	2.50	6.40	7.50	5.90	Right Angle

4-Circuit Battery Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	47282-0001	2.00	1.80	9.30	6.60	Right Angle
	47480-0001	2.00	1.94	10.33	4.00	Right Angle
	47420-0001	2.00	2.60	8.00	5.48	Vertical
	47417-0001	2.00	2.95	8.10	5.98	Vertical

Battery Connectors

4-Circuit Battery Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	47359-0001	2.00	3.10	8.00	5.98	Vertical
	47604-0001	2.00	3.53	10.30	5.81	Right Angle
	105038-0001	2.00	3.65	8.00	5.98	Vertical
	47103-0001	2.00	3.75	8.10	6.48	Vertical
	47327-0001	2.00	3.75	8.10	6.48	Vertical
	47615-0001	2.00	3.87	8.00	3.55	Right Angle
	47531-0001	2.00	4.00	8.00	5.05	Right Angle
	47531-0011	2.00	4.00	8.00	5.05	Right Angle
	105029-1001	2.00	4.70	8.10	6.48	Right Angle
	47410-0001	2.00	4.90	8.00	6.46	Vertical
	47575-0001	2.00	5.80	8.50	6.30	Right Angle
	47507-0001 (Without Mylar Tape)	2.00	5.90	9.20	3.20	Right Angle
	47507-0010 (Without Mylar Tape)	2.00	5.90	9.20	3.20	Right Angle
	47534-0001	2.00	6.84	20.73	5.40	Right Angle
	47592-0001	2.00	6.93	20.98	5.40	Right Angle

6-Circuit Battery Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	94322-5006	3.00	5.10	17.20	8.60	Right Angle

8-Circuit Compression Connectors

	Order Number	Pitch (mm)	Height (mm)	Width (mm)	Depth (mm)	Entry Type
	47233-0001	1.20	4.26	5.30	7.55	Vertical

* Note: See molex.com for a full listing of available part numbers.

INTRODUCTION

Molex is a pioneer and world leader in the design and development of miniature I/O connectors for tablet and other mobile applications. We have helped set the standards and have been first to market with some of the industry's smallest and most innovative I/O connectors, such as HDMI Type-D Micro versions.

We offer a broad range of industry-standard micro I/O connectors and also custom capabilities. We offer miniature hybrid I/O connectors that integrate multiple functions such as battery terminals, charger pads, circular DC jacks, RF contacts, and even IR modules all in one. We also offer a full range of in-house cable assemblies in the lengths and styles you need.

Product Overview

HDMI Type-D Micro
- SMT, Through-hole and hybrid mounting styles
- Kapton tape for pick-and-place
- Cable adapter option

Micro-USB
- Micro-B and AB receptacles
- Top, Reverse and Mid-Mount styles
- Cable assemblies in various lengths

Mini-USB
- Meets USB OTG specifications
- Full range of B and AB versions

I/O Connectors

molex®

FEATURES AND BENEFITS

HDMI Type-D Micro

Rear shell-over-housing design prevents connector damage caused by over-insertion of cable plug
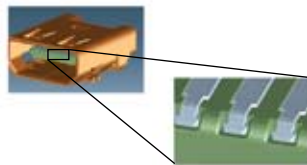
Receptacle contacts are interlocked into the housing to prevent terminal lift or stubbing

Micro-USB
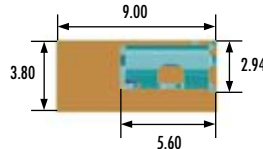
Size comparison of Micro-USB and Mini-USB

Lead-in features allow blind mating

Mini-USB (On-the-Go)

54819

51387
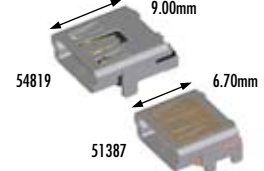
Mini-B Short Body

Mini-B & Mini-AB (67503 and 67803 series) with back cover shell for additional EMI protection

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SELECTION MATRIX

HDMI Type-D Micro Connectors

	Order Number	Shell Tabs	PCB Mounting	Circuit Sizes	Height (mm)	Width (mm)	Depth (mm)
	46875-3001	SMT	Mid	19	1.72	6.50	10.37
	46765-0001	SMT	Top	19	2.90	6.50	7.50
	46765-1001	Through Hole					
	46765-2001	SMT & Through Hole					
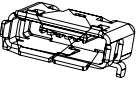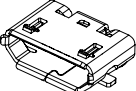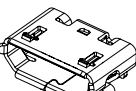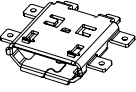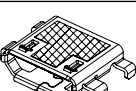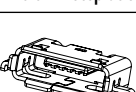
HDMI Type-D Micro-to-HDMI Type-A Cable Assemblies

	Order Number	Length	AWG	Circuit Sizes	Color	Height (mm)	Width (mm)
	68786-0001	1.00 Meters (3.28 feet)	34	19	Black	7.00 (HDMI Type-D) 10.00 (HDMI Type-A)	10.00 (HDMI Type-D) 20.00 (HDMI Type-A)

HDMI Type-D Micro-to-HDMI Type-A Cable Assemblies

	Order Number	Length	AWG	Color	Circuit Sizes	Height (mm)	Width (mm)
	68786-0003	2.00 Meters (6.56 feet)	32	Black	19	7.00 (HDMI Type-D) 10.00 (HDMI Type-A)	10.00 (HDMI Type-D) 20.00 (HDMI Type-A)
	68786-0004	0.10 Meters (3.94 inches)	34				
	68786-0005	0.20 Meters (7.84 inches)					
	68786-0006	1.50 Meters (4.92 Feet)	36				
	68786-0007	0.20 Meters (7.84 inches)	32				
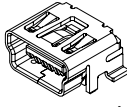
0.65mm Pitch SMT Micro-USB I/O Connectors

	Order Number	Shell Tabs	PCB Mounting	Circuit Sizes	Height (mm)	Width (mm)	Depth (mm)
micro-AB Receptacle	47590-0001	Through Hole	Top	5	2.50 Nominal (3.00 max)	7.50 Nominal (8.20 max)	5.80
micro-AB Receptacle	47589-0001	Through Hole	Reverse	5	2.50 Nominal (3.00 max)	7.50 Nominal (8.20 max)	5.80
micro-B Receptacle	47346-0001	SMT	Reverse	5	2.45 Nominal (2.94 max)	7.50 Nominal (7.80 max)	5.00 (5.43 max)
micro-B Receptacle	105017-0001	SMT	Reverse	5	2.45 Nominal (2.94 max)	7.50	5.00
micro-B Receptacle	47491-0001	SMT	Mid-Mount	5	2.45 Nominal (2.94 max)	7.50 Nominal (11.00 with Shell Tabs)	6.90 (9.13 with Solder Tails and Tabs)
micro-B Receptacle	47491-0002	SMT	Mid-Mount	5	2.94	11.00	8.70
micro-B Receptacle	47642-0001	SMT	Mid-Mount	5	2.94	6.90	7.23
micro-AB Receptacle	47654-0001	SMT	Mid-Mount	5	2.71	7.50	5.80

molex® **I/O Connectors**
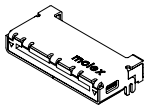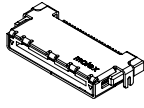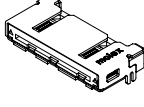
USB A-to-Micro-USB B Cable Assemblies

	Order Number	Length	AWG	Color	Circuit Sizes	Height	Width
	68784-0001	1.00 Meter (3.28 Feet)					
	68784-0002	1.50 Meter (4.92 Feet)	28	Black	5	6.40 (micro-USB B) 7.50 (USB Type A)	10.80 (micro-USB B) 15.00 (USB Type A)
	68784-0003	2.00 Meter (6.56 Feet)					

0.80mm Pitch Mini-USB Receptacles

	Order Number	Shell Tabs	PCB Mounting	Circuit Sizes	Height (mm)	Width (mm)	Depth (mm)
mini-AB Receptacle	67803-8020	SMT	Top	5	4.00	7.70 (9.90 with Shell Tabs)	9.00
mini-AB Receptacle	56579-0576	SMT	Top	5	3.95	7.70 (9.90 with Shell Tabs)	9.00
mini-B Receptacle	51387-0530 Short Body	SMT & Through Hole	Top	5	3.95	7.70 (9.10 with Shell Tabs)	6.70
mini-B Receptacle	54819-0572	SMT	Top	5	3.95	7.70 (9.90 with Shell Tabs)	9.00
mini-B Receptacle	67503-1020 (1.00mm Locator Pegs) 67503-1030 (0.80mm Locator Pegs)	SMT	Top	5	3.95	7.70 (9.90 with Shell Tabs)	9.00

0.50mm Pitch 24-Pin Shutter I/O Connectors

	Order Number	Shell Tabs	PCB Mounting	Circuit Sizes	Height (mm)	Width (mm)	Depth (mm)
	49045-0011	Through Hole	Top	24	3	16.35	8.20
	49437-2411	Through Hole	Mid	24	3	19.00	8.20
	49349-2411	Through Hole	Reverse	24	3	16.40	8.20

INTRODUCTION

Molex has sockets for a wide range of camera module sizes, ranging from 6x6 to 8.5x8.5mm. These sockets are available in SMT top-mount versions, and are designed for automated placement.

We also have optional EMI shielding covers and module remover tools as complementary product offerings to the sockets. We are continually expanding our camera socket offerings by working with mobile device makers and module suppliers.

molex®

Camera Module Sockets

Product Summary
- Camera module sizes (mm): 6x6, 6.5x6.5, 7x7, 8x8, 8.5x8.5
- Board mounting: SMT normal (top) mount
- Bottom contact and side contact
- Circuit sizes: 20 and 24
- EMI shielding cap
- Suitable for automated assembly
- Optional camera module removal tool

FEATURES AND BENEFITS

Camera locking and EMI shielding top cover
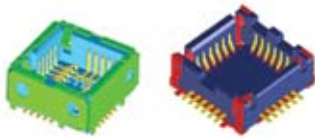
Sockets for various module sizes and contact types
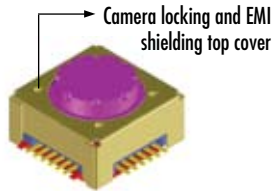
Optional metal shield for EMI protection
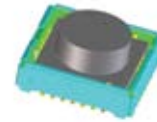
Normal (Top) mounting is standard style

Optional extraction tools

Extraction Process

SELECTION MATRIX

	Order Number				Camera Module Size (mm)	Contact	Pitch (mm)	Circuit Sizes	PCB Mounting	Height (mm)	Width (mm)	Length (mm)
	Socket	Metal Cover	Pick and Place Cap	Module Remover								
	47578-0001	47578-0006	Yes	47356-0007	6x6	Bottom	0.65	20	Top	4.00	8.20	8.20
	47586-0001	47586-0004	No	47586-0008	6.5x6.5	Side	0.90	24	Top	4.00	8.60	8.60
	78499-0001	N/A	Yes	N/A	6.5x6.5	Bottom	0.60	24	Top	3.50	8.00	8.00
	78499-0002		No									
	105076-0001	N/A	No	105076-0005	7x7	Bottom	0.70	24	Top	3.95	9.00	9.00
	47249-0001	47249-0005	No	47249-0007	8x8	Side	0.90	24	Top	4.20	10.10	10.10
	47337-0200	47337-0005	No	47337-0007	8.5x8.5	Side	0.90	24	Top	4.20	10.60	10.60
	105028-1001	105028-8206	No	105028-0018	8.5x8.5	Side	0.90	32	Top	4.20	10.60	10.60

INTRODUCTION

Molex offers Pogo Pin connectors for applications such as speakers, vibration units and antennas, which are all shrinking due to down-sizing needs. These applications demand robust, high cycle and small interconnect solutions to support repeated mechanical stress exerted on the connector during usage.

Molex's range of Pogo Pin connectors have been designed to meet the needs of these applications. Our proven designs provide a highly durable point-to-point contact when assembled. The pin height is flexible and can be made according to customers' request.

Molex is able to provide solutions for a variety of configurations with different pitch size.

Product Summary
- Pitch: 2.00 to 4.00mm
- Circuit sizes: 2 to 4
- Spring force: 50 - 108g*
- Current: 0.5 to 3A Max.*
- Durability: 2,000 to 20,000 cycles*
- Lowest: Initial height 2.20 and working height 1.65mm
- Highest: Initial height 6.60 and working height 5.60mm
- Round shaped terminal design
- Single row and dual row array available

Please check the product specifications for the specific application requirements.

FEATURES AND BENEFITS

The round-shaped spring terminal design accepts positioning and tilting tolerances while still maintaining stable contact
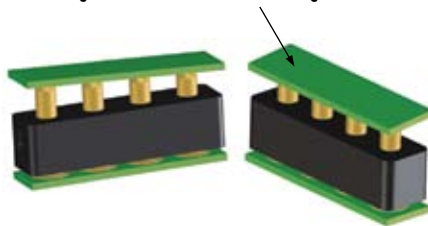
Pick-and-place caps enable fully automated operation
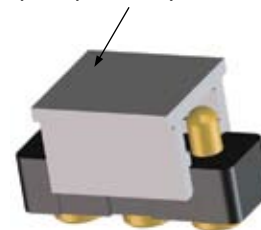
SELECTION MATRIX

Single Row

	Order Number	Pitch (mm)	Circuit Sizes	Height (mm)	Working Height (mm)	Width (mm)	Length (mm)	Spring Force* (g)
	47282-0001 Right angle	2.00	4	6.60	5.60	6.60	9.30	108
	47310-0001	2.50	2	2.80	1.80	2.00	5.00	80
	47310-0041	2.50	2	2.80	1.80	1.40	5.00	50
	47245-0001	2.54	3	4.15	3.35	2.75	8.00	90
	47038-0001	4.00	2	2.25	1.70	2.40	6.40	100
	47038-0041	4.00	2	2.20	1.65	2.40	6.40	100
	47341-0001 (0.1µm gold plating)	4.00	2	2.60	2.00	2.40	6.40	80
	47341-0041 (1.0µm gold plating)	4.00	2	2.60	2.00	2.40	6.40	80
	47496-1041	4.00	2	2.90	2.30	2.40	6.40	80

Spring forces are measured at working height.

Pogo Pin Connectors

Single Row

	Order Number	Pitch (mm)	Circuit Sizes	Height (mm)	Working Height (mm)	Width (mm)	Length (mm)	Spring Force* (g)
	47393-2001	4.00	2	3.95	3.18	2.00	6.15	100
	47119-0001 (0.1μm gold plating)	4.00	2	5.40	4.32	2.30	6.50	75
	47119-9001 (0.3μm gold plating)	4.00	2	5.40	4.32	2.30	6.50	75
	67904-0001	4.00	2	5.40	4.32	2.30	6.50	67

* *Spring forces are measured at working height.*

Dual Row

	Order Number	Pitch (mm)	Circuit Sizes	Height (mm)	Working Height (mm)	Width (mm)	Length (mm)	Spring Force* (g)
	47393-0001 (0.3μm gold plating)	2.50 x 2.50	4	3.95	3.25	4.65	4.65	100
	47393-5001 (1.02μm gold plating)	2.50 x 2.50	4	3.95	3.25	4.65	4.65	100

* *Spring forces are measured at working height.*

INTRODUCTION

Molex is a world leader in the design, development and manufacture of custom antennas and assemblies for wireless and mobile applications. In particular, we are a market leader for 3D antennas produced by LDS and two-shot technology. We specialize in customized designs with a focus on small multiband antennas (including Pentaband and 4G LTE) and complementary (NFC, internal FM, BT/GPS, WLAN) antennas.

Our Laser Direct Structuring (LDS) technology offers flexibility and geometric 3D design freedom in making antenna products beyond the previously often-used flex-antenna technologies, which only allow a maximum 2.5D design of the antenna radiator. Using a 3D laser system, LDS technology allows the transfer of the antenna design from CAD data into a molded antenna carrier or even directly onto the device structure. Cosmetic surfaces of the antenna can also be achieved by using a subsequent spray-painting process.

Integrated Manufacturing
Molex offers a full range of integrated manufacturing services under one roof, including all antenna component sub-processes. This provides greater manufacturing efficiency and quality control. Our in-house capabilities include:

- Single, two-shot and metal insert molding
- LDS and two-shot plating of plastics
- SMT soldering
- Stamping and plating of metal antenna radiators
- Flex antenna assembly
- Class 2 cosmetic painting of antennas
- RF and audio testing

GLOBAL ANTENNA CAPABILITIES

- ● Manufacturing Plant
- ● Project Management
- ● RF and Mechanical Engineering
- ● 3D Anechoic Chamber
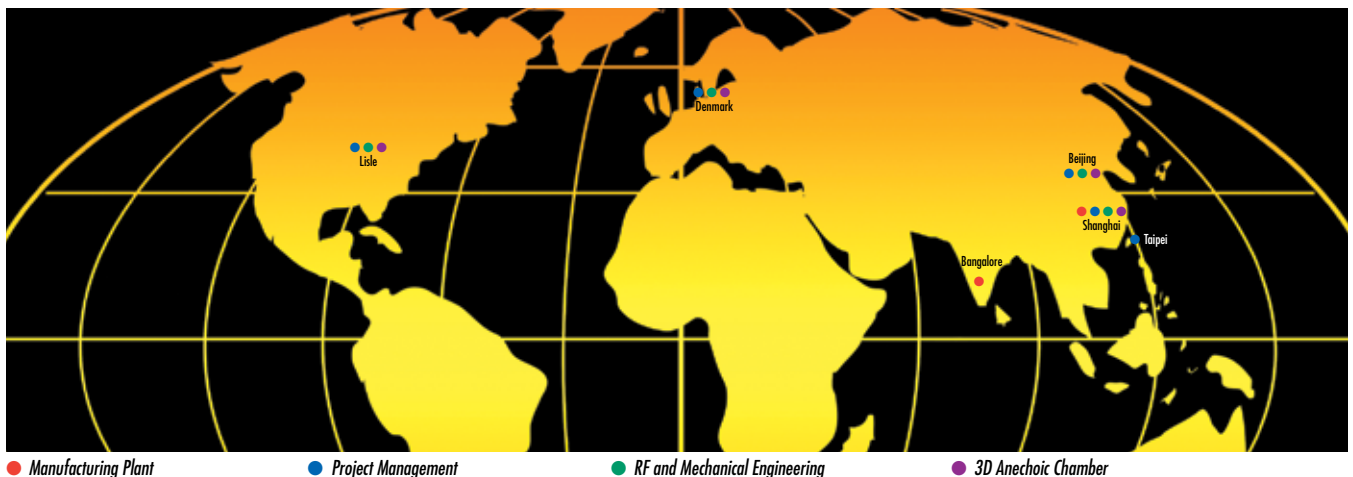
TYPES OF INTERNAL ANTENNA PRODUCTS

Internal Antenna (Flex subassemblies)

Acoustic Antenna Modules

LDS Antennas

Internal Antenna (Stamped Radiator)

Internal Antenna (Flex Radiator)

Two-Shot Antennas

INTRODUCTION

Molex manufactures various types of product assemblies for tablet and other mobile devices. These include metal dome foil, EL dome foil, FPC or PCB keypad assemblies, side switches, hinge flex with connectors & FPCA for interconnections.

Keypad assembly with "Light Guide Film" is a popular new choice for mobile device manufacturers as a way to spread the light with fewer LEDs. Molex has the engineering expertise to incorporate this new technology into our keypad assemblies, such as the Qwerty Key version shown below.

Product Summary

■ Molex offers a wide range of metal domes for mobile devices with different trip forces, click ratios, plating and shapes

■ Metal dome foil (array) with or without silver ink shielding/air-venting

■ EL foil as thin as 0.10mm thickness, option of blue & white light

■ Embossed graphic overlay user interface keypad

■ PCBA or FPCA with Molex connectors and/ or sockets

molex®

Switches and Printed Circuit Products

NEW CAPABILITIES FOR SMART PHONES

Qwerty Key (D/S FPC + LED + Metal Dome + Light Guide Film laminated + Shading film + Metal supporter)

Registor Touch Panel (D/S FPC + AG/ACP Printing + Flex-to-Board connector)

Capacitive Touch Panel (D/S FPC + AG/ACP Printing + IC controller)
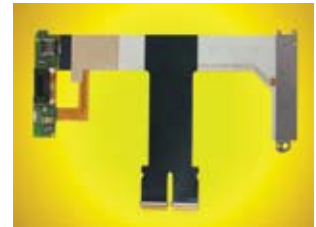
Hinge FPC (D/S FPC + EMI shielding film + Impedance control with extra thin core 37µm for sliding over 100K times)

EXAMPLES OF PRINTED CIRCUIT PRODUCT (PCP)

EL dome foil

EL dome foil on flex (keypad)

Metal dome foil

Metal dome foil on flex (keypad)

Camera socket flex assembly

Metal dome foil and keypad PCBA

Metal dome foil on keypad FPCA

FPCA for Mobile Phone Cradle

PCI EXPRESS® MINI CARD CONNECTOR

Leveraging our design and manufacturing expertise in applications for the mobile computing industry, Molex showcases custom solutions for ultra-low-profile, mid-mount PCI Express® Mini Card connectors for next-generation communication devices.

Molex's innovative technology enabled the custom-ization of a right angle, mid-mount PCI Express® Mini Card connector with an ultra-slim mounted height of only 1.70mm (.067") targeted for wireless and wired data communication devices. This 0.80mm (.031") pitch, 52-pin connector offers 50% more vertical space savings than the lowest 4.00mm (.157") height top-mount versions currently available in the market. The connector has a wide, 33-degree PCB module entry angle that allows easy PCB module insertion. Evenly spaced rectangular slots in the front and rear areas of the connector housing helps reduce connector warpage during the molding process and ensure connector co-planarity.

Product Summary
- Meets PCI Express® Mini Card Electromechanical Specification Revision 1.2
- Minimum mid-mount connector height of 1.70mm (.067") above PCB offers more vertical space savings than top-mount versions and is ideal for low profile applications
- Robust blade-like soldertails ensure connector terminals are able to withstand application-process-related vibrations
- Tight-fitting reinforced housing ribs between the SMT soldertails prevent bent pins while ensuring linearity and accurate positioning of the blade-type SMT soldertails
- Rectangular slots across connector housing prevent connector warpage during molding; provides greater material savings with less housing material used
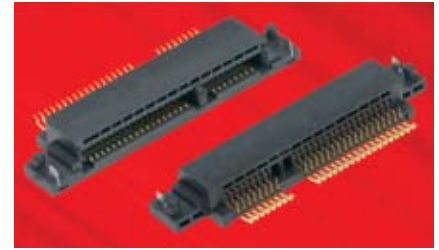
PCI Express® Mini Card Connector
Right Angle, Low-Profile, Mid-Mount
(Series 48344)

Configuration Details

Description	Termination Style	Plating	Connector Positioning and PCB Retention
Right angle, low-profile, mid-mount PCI Express® Mini Card connector, with minimum mount height of 1.70mm (.067")	Hybrid through-hole and SMT	Gold (Au) Flash	Pegs and solder tabs
	Through-hole		
	SMT		
	Hybrid through-hole and SMT	0.25 - 0.76µm (10-30µ")	Crush-rib Pegs and Forklocks
	Through-hole		
	SMT		

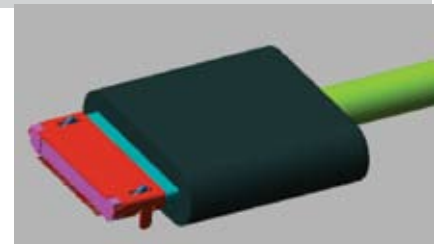*Contact Molex for availability and ordering details.*

UNILINK HANDHELD DEVICE I/O SOLUTION

In an effort to bring order to the growing number of custom I/Os in the handheld device market, Molex has developed its new "UniLink" I/O concept to provide a compact single interface to deliver high-speed data and audio/video streams along with power charging.
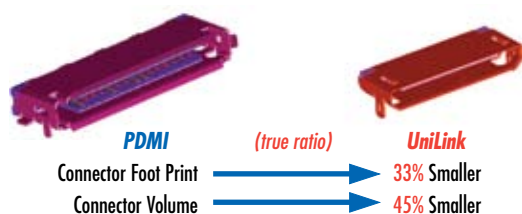
The new 0.40mm pitch UniLink system is electrically compliant to the PDMI (Portable Digital Media Interface) specification, while providing about 40% space savings over PDMI connectors. The system includes a robust latching design that provides secure mating retention while minimizing component costs. Both male and female connectors are fully shielded to prevent EMI leakage, and include polarization guides to prevent terminal damage from any possible mismating.

Product Summary
- Active latching design
- Insert-molding terminal assembly
- D-shaped chamfer interface design to facilitate polarized mating
- Fully shielded metal shell to reduce EMI/RFI emissions on signals
- Compatible with auto pick & place SMT process
- Package in tape & reel to be automatically loaded
- RoHS and Halogen-Free Compliant

Smaller Then PDMI

PDMI → *(true ratio)* → **UniLink**

Connector Foot Print → 33% Smaller
Connector Volume → 45% Smaller

	PDMI Connector	UniLink Connector	Improvement %
Pitch	0.5mm	0.4mm	20%
Circuit Size	30	30	
Contact Rows	2	1	
Width (W)	21.9mm	17mm	22.3%
Depth (D)	7mm	6mm	14.2%
Height (H)	3mm	2.5mm	16.6%

Contact Molex for availability details.

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one company › a world of innovation